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A Study of Personalized Learning and its Impact on Middle School Teachers and Students

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in fulfillment of final requirements for the MAED degree

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Abstract

The purpose of this action research study is to investigate the cost-benefit of personalized learning and if it was an effective use of time and resources in the middle school classroom. The research was conducted in a sixth-grade mathematics classroom in a small town in Western Minnesota, and an eighth-grade science classroom from a medium size suburb of St. Paul, Minnesota. The data was collected using student assessment scores, student surveys, and teacher reflection journals. The data collected was triangulated to determine if the implementation of a personalized learning method known as The GRID Method was beneficial for both the teacher and students. Both teachers found it to be an effective use of time and resources and plan to use it for future units.

Keywords: personalized learning, autoethnography, GRID Method

As the landscape of education shifts from a traditional teacher-led classroom, to a more student-centered classroom, so too do the demands on a classroom teacher. Educators lives are inundated with the latest research, accompanied by the profession's new focus. Teachers strive to add more formative assessment and feedback, incorporate standards-based grading, create lessons that are more engaging, use more technology, increase collaboration, differentiate, be culturally responsive, teach to the test, don't teach only to the test, build critical thinking skills, and foster creativity. Educators are asked to accomplish these essential facets of student development all while finding ways to meet the needs of each individual student, in a classroom of anywhere from thirty to forty students. No matter what grade or subject is taught, there are always students with different levels of ability in the class. These different skill abilities often cause behaviors in the classroom that can limit student learning simply because of the demands of trying to meet each student where they are at.

One approach presented as a solution to address behaviors and meet the goals of all stakeholders involved: community, district, teachers, and students, is to incorporate personalized instruction into the classroom. Personalized learning, is a technology-based instructional model designed to tailor instruction to student needs, strengths, and interests to promote mastery of skills and content. Personalized learning is also meant to provide high levels of choice and flexibility for both students and teachers (Bingham, Pane, Steiner, and Hamilton 2018).

There has been a tremendous amount of time and money spent on how to implement personalized learning in the classroom. There has also been a significant push by big technology companies to get educational administrators on board with this technology-infused initiative. However, there is a lack of research-based evidence to support or refute the need to change the

practice of whole classroom instruction to individualized instruction. Not to mention, an answer to the underlying question of what is the cost-benefit in changing teaching practices in the classroom? Do students acquire new knowledge more efficiently when given a choice, and allowed to work at their own pace? Is the time invested by the teacher before, during, and after a personalized unit, realistic and manageable? Due to the lack of evidence and answers, it is difficult for all stakeholders to make informed decisions with regard to the allocation of time, and money, to determine if a change in teaching practices is necessary to provide students with the skills needed in this 21st-century world.

As a result of the shift to a more student-centered classroom, school administrators and teachers alike look for innovative ways that will meet the needs of individual students by introducing content in the form of self-paced personalized learning sequences. Because of this, teachers are asked to negotiate and balance the needs of the individual versus the needs of the many by creating lesson plans and materials that satisfy both the community of thirty to forty learners and the individual student. Little is known about the effectiveness of personalized learning in the middle school classroom. Current studies have focused on student engagement and not on the outcome of knowledge acquisition or the educator's perspective of time spent preparing and classroom management. Therefore, the purpose of this action research study is to investigate the cost-benefit of personalized learning and if it is an effective use of time and resources in the middle school classroom.

Theoretical Framework

Personalized learning as a teaching strategy was a result of a culmination of various psychological constructs and educational theories. The combination of Goal Orientation Theory

(Ames & Archer, 1988), Self-Determination Theory (Ryan & Deci, 2000), and the Theory of Flow (Csikszentmihalyi, 2014), form the foundation of the individual learning experience we call personalized learning.

An integral component of personalized learning is a student's ability to set goals and be motivated to reach those goals. Both goal setting and student motivation are confounding variables in a traditional classroom where all students are learning the same content at the same time. Given the premise of personalized learning as self-paced and actualized, the process of setting individual goals with a class of thirty to forty students, in addition to keeping all motivated to achieve those goals, can frankly seem overwhelming and insurmountable for even the most seasoned educator. Goal Orientation Theory gives the teacher a realistic idea of how to navigate the process of classroom integration and function. Ames and Archer (1987) described that students are motivated by two goals: mastery and performance. Mastery goals are achieved by a student's motivation and work towards the mastery of a skill or acquiring a predetermined level of understanding of a concept resulting in a student sense of success. Performance goals are based on an individual's measurement of ability as compared to another individual or group (Ames & Archer, 1987). Ames and Archer (1987), based on their findings in conjunction with other research on Goal Orientation, asserted that performance goals can lead a student to devalue their ability resulting in a negative opinion of themselves. Ames and Archer (1987) suggested that an educator's focus on mastery goals, combined with helping students set realistic goals paralleled with a pathway to reach those goals, is a long term benefit for the student in knowledge acquisition. Equally important, a student gains an understanding of the relationship between effort and mastery of a skill or concept. The decision to use the GRID Mastery of

Learning Method as our personalized learning instructional strategy was shaped in part by the mastery goal component of the Goal Orientation Theory.

Self-Determination Theory describes the role of meeting the psychological needs of competency, autonomy, and relatedness, in promoting self-motivation and positive psychological development (Ryan & Deci, 2000). Furthermore, they asserted a connection between self-motivation and the ability to self-regulate, both instrumental in goal attainment. Ryan and Deci (2000) added that by giving an individual autonomy over the construct of the goal, the more likely the goal will be reached. Because of the strong connection between self-motivation and self-regulation, one must ask, “What is the mechanism that causes a person to be motivated?” Ryan and Deci (2000) identified the two types of motivation relevant to Self-Determination Theory as intrinsic and extrinsic. Intrinsic motivation is described as a person's natural tendency to explore their inner interest, which in turn, brings enjoyment, and is necessary for cognitive and social development (Csikszentmihalyi & Rathunde, 1993; Ryan, 1995 as cited by Ryan & Deci 2000). Alternately, extrinsic motivation is driven by social pressures to do things and activities that are not interesting (Ryan & Deci, 2000). It is intrinsic motivation combined with the autonomy that leads to higher student achievement (Deci, Ryan, & Williams, 1996). It is the improvement of student outcomes that factor into the mainstream shift to a more student-centered way of thinking in our classrooms. Personalized learning epitomizes the Self-Determination Theory of learning by providing opportunities for students to be invested in the outcome by allowing them the autonomy to make a goal, self-regulate the pace, and gain understanding in ways that are meaningful to them.

The Theory of Flow (engagement) encompasses the relationship between focus, interest, and enjoyment of completing a task (Shernoff, Csikszentmihalyi, Schneider, & Shernoff, 2003). Csikszentmihalyi (1997) further stated that in order for flow to occur, this relationship must happen simultaneously. The cornerstone of this theory is the following criteria are present to facilitate flow: clear goals must be set, the challenges must be aligned with the skill level of the student, and immediate and ongoing feedback must be present. The role of the relationship between the challenge and skill level is especially important, because mismatched the result can cause apathy or anxiety (Csikszentmihalyi, 1990). Shernoff et al. (2003) asserted the ideal way to engage students leading to a “flow state” is this pairing of skills to challenge, incorporating immediate feedback, and scaffolding instruction, so each skill or concept learned builds upon the other. Because flow is intrinsically rewarding, the student will continue to replicate the process to fulfill the psychological effect it provides as the individual learns and masters a new skill or content, the cycle fosters both academic and personal growth and a sense of accomplishment (Nakamura & Csikszentmihalyi, 2002; as cited by Shernoff et al., 2003)

The GRID Mastery Learning Method, which the authors, have chosen for this research incorporates the fundamentals of the Theory of Flow. Students move at their own pace from one skill to the next. Formative assessment and immediate feedback is a necessary component as students master content and skill level. Knowledge is acquired and built upon as students navigate a sequential process toward mastery. Content and activities are differentiated to ensure the appropriate pairing of skill to challenge.

Autoethnography

Flavell (1979) defined the Metacognition Theory of Learning as the ability to monitor your memory, comprehension, cognitive functions and create a new deeper understanding. Put simply, metacognition is, “thinking about your own thinking.” Flavell went on to break down metacognitive knowledge into three parts or variables; person, task, strategy. He defined the person variable as the way we see ourselves and how we view or make sense of the world around us. The task category relates to what new understanding is being acquired and the level to which you can recall it at a later time. The task variable is also influenced by how readily the information to be gained is available, organized, engaging, and credible. The third and final category is the strategy. How is the new information presented and acquired, and what is the person's beliefs with regard to the effectiveness of said strategies? Flavell (1979) asserted that it was a combination of intentional interactions he called metacognitive experiences with the aforementioned metacognitive knowledge, that allows a person to set learning goals and make revisions as necessary. Furthermore, he stated it paved the way for knowledge to be added to, deleted, or revised. Friere’s concept of conscientization (Freire, 1971), of being self-aware of one's reality through reflective practices resulting in a changing reality, supports Flavell’s assertions that metacognitive practices in conjunction with purpose results in growth.

“Autoethnography is a research method that engages the individual in self-analysis, cultural analysis, and interpretation” (Chang, 2008, as cited by Starr, 2010). This, however, is not a finite definition of autoethnography. Autoethnography is not only a study of self, but it also serves as a bridge between who we are as educators and what we do in our classrooms. The lens we see through as teachers, where we fit into the culture and climate of education as a whole, our

place in the school district, the space we fill on our teams, and finally, the culture of learning in our classrooms, is what drives intentional practice and fosters a sense of purpose (Starr, 2010). How teachers make sense of the world in which they practice, in addition to deliberate adaptations and differentiation in instruction, a product of self-reflection, is critical to student and teacher success. All too often, action research focuses solely on the growth of the student, or the effectiveness of a specific teaching strategy, without due process given to the transformation of the individual teacher facilitated by the metacognitive learning process of Autoethnography. It is the author(s)'s intention to combine the qualitative aspect of Autoethnography, the study of self, with the quantitative aspect of action research as defined by Lewin (1964) as the analysis of a problem with the intention of improving a specific practice (Bath, 2009).

Review of Literature

Classroom

Schools looking to improve the “traditional classroom” methods of lecture style lessons may seek new teaching methods such as personalized learning to enable better the technology savvy students of today also referred to as “21st Century learners.” Although some of the methods to do this are newer, the idea of transitioning the classroom to engage students has been around for a long time. Landon (1974) discussed the idea of an “open classroom” to allow students to explore interests beyond the materials presented by the teacher. Newer methods include personalized learning, individualized learning, and differentiation (Johnsen, 2016). However, Horn (2017) suggested that the definition of what personalized learning is is unknown. “Some definitions emphasize students have a voice and choice in what they learn, along with the customization of how, when, and where they learn it. Other frameworks focus on self-paced

learning methods, powered by technology” (Horn, 2017, para. 1). The Office of Educational Technology agreed that there are varied definitions of personalized learning and defined it is “Instruction paced to learning needs, tailored to learning preferences, and to the specific needs of individual learners” (2016, page 7). Clarke (2013) added personalized learning includes student ownership and accountability. Netcoh (2017) described personalized learning as a collaboration between teacher and student to create goals and outcomes that incorporate student interest and content standards. Nagle and Taylor (2017) disagreed and stated that personalized learning is a structured teacher centered option and that personal learning through flexible pathways is more beneficial to students.

With the definition varying from source to source, it is hard to define what personalized learning is and find out if it increases student engagement, motivation, and knowledge acquisition. For our action research, we will use the definition as provided by Bingham, Pane, Steiner, and Hamilton (2018). Personalized learning is a technology-based instructional model designed to tailor instruction to student needs, strengths, and interests to promote mastery of skills and content. Personalized learning is also meant to provide high levels of choice and flexibility for both students and teachers (Bingham et al. 2018). This type of personalized learning was suggested by Horn (2017) who maintained personalizing the method and activities for each student to meet them where they are at to maximize their academic growth. This would agree with the flexible pathways indicated by Nagle and Taylor (2017).

Challenges and Opportunities:

One key component of personalized learning is student choice and voice in a partnership with the teacher in creation, implementation, and management of the learning process (Bray &

McClaskey, 2015; as cited by Netcoh, 2017). However, research suggests student choice brings both risk and reward to a personalized learning-oriented classroom (Netcoh, 2017). Netcoh asserted in his study of personalized learning that some students felt when teachers offer choices it is one of the few opportunities they have some control and autonomy over what they learn and how. In personalized learning students are empowered as creators because it allows them to be critical thinkers while solving real-world problems. It also allows students to collaborate with others (Aitken, 2017). The Office of Educational Technology, (2016) agreed that teachers need to include “21st-century skills” such as critical thinking, collaboration, and multimedia communication into the learning of our classrooms to help keep American Education globally competitive. These types of skills can be associated with personalized learning and often give students a feeling of voice and choice in their learning. Additionally, by increasing student voice and choice, a student’s motivation and engagement in education will also increase (Bray & McClaskey, 2015; as cited by Netcoh, 2017).

However, some students struggle with the lack of structure, having to make choices as to the pathways toward expected outcomes. For Netcoh (2017) this resulted in some students’ inability to manage their work time effectively. Teachers discovered one of the challenges of personalized learning was to hold students accountable while managing the many fluid aspects of personalized learning within the confines of a classroom and class period (Bingham, 2017). In addition to classroom practices and procedures, additional challenges are occurring due to the lack of clear direction and distinction surrounding the term “personalized learning.” Teachers feel the need to cover the grade level standards due to high stake tests (Johnsen, 2016) or because a spiraling curriculum of learning depends on teachers doing their share of the assigned content

and skills. Robinson and Sebba (2010) suggested instruction can be a combination of student-led, personalized learning or student influenced, individualized learning. More schools can achieve the student-influenced learning as teachers align the activities to the standards while taking into consideration student interests.

Student-led learning is more challenging for schools to implement as it allows students to be in charge of what they learn, how they learn it and when they learn. According to Horn (2017), this method is unreliable since students don't always know what they should be learning or may have interests that are not beneficial to their overall learning. Due to multiple variations of what personalized learning could look like at the district, school, and classroom level, it is challenging for administrators and teachers to establish school-wide best practices. A defined personalized learning program, instructional best practices, and teacher professional development are necessary for the successful implementation of personalized learning as a schoolwide initiative (Bingham, 2017). However, advocates of personalized learning argue that even with the inconsistencies regarding what personalized learning is, in terms of teacher-student driven and levels of student involvement, there is potential for positive outcomes as long as teachers and students are given the support and tools necessary to effectively implement this strategy into a classroom (Basham, Hall, Carter, Stahl, & Smith, 2016).

Implementation Studies and Findings Regarding Best Practices

Basham et al., (2016) stated there are many moving parts when implementing personalized learning these parts include: student profiles, flexible paths, alternative grading systems, and a flexible learning environment. Schaffhauser (2013) argued that there is one more piece to successfully implement the new method of learning, which is time. When implementing

personalized learning, it is important not to try to apply everything at once, or the school and teacher can become overwhelmed. Schaffhauser (2013) suggested implementing different areas starting with the student profiles slowly. Without reliable data to show student strengths and weaknesses, it is hard to create strong interventions or pathways to learning for individual students. The last things to implement should be the grading system and flexible pathways, as these will be the hardest parts to change. Parents, teachers, and students will all need time to learn the new grading system which is why it is so hard to replace. Teachers will also need to change their teaching practices.

Changes in Teaching Practices:

With the implementation of personalized learning into the classroom, the role of the teacher shifts from holder and deliverer of knowledge, to that of co-creator, and facilitator of learning (Nagle, 2017). As personalized learning becomes the new strategy of the future, so does the use of technology to streamline the process for access to meaningful, reliable content. According to Aitken (2017), a vital part of individualized learning is the ability to be 1:1, a term that means having a digital device in each student's hands which allows teachers to implement activities that are individualized to the student's interests and can be completed at the student's own pace. With that said, there are underlying considerations that influence the success of technology integration to support personalized learning implementation. These considerations lie in the teacher's belief system regarding the use of technology in the classroom, and the overall teaching-communities' practices and comfort with technology integration (Bingham et al., 2018). Bingham et al. (2018) stated that although there is a lack of research about how teachers have implemented personalized learning, there is research to support the idea that a teacher's age and

level of experience influence how he respond to new instructional strategies such as personalized learning. Bingham et al. (2018) cited research conducted by Hargraves (2005), which revealed because newer teachers had not yet developed a sense of self-identity as compared to veteran teachers, this made the new teacher more adaptable and open to trying new teaching strategies.

Cost/Benefit:

In reviewing the multiple moving parts required to implement and sustain personalized learning into the classroom environment and teaching practice, it is not a stretch to be concerned about the increase in the amount of time to plan and prepare spent by a teacher on personalized and individualized plans, in addition to defining multiple expectations for desired outcomes (Basham et al., 2016; Netcoh & Bishop, 2017). There is a lack of peer-reviewed empirical research to support the effectiveness of personalized learning versus group instruction of content with differentiation incorporated into the delivery and outcomes (Bingham et al., 2018).

Overall Effectiveness:

Advocates of PL claim potential to improve outcomes for traditionally underserved and gifted/accelerated students (Patrick et al, 2013; U.S. Department of Education, 2015). While there has been a significant push for a symbiotic relationship between technology and personalized learning, research supports a focus on school culture, curriculum, environment, pedagogy, and systems as other aspects of the learning environment. Additionally, there should be some focus on school-wide systems that consider the needs of individual learners (Basham et al., 2016).

The educational system could be revolutionized by personalized learning, however to accomplish this schools need to do away with the idea of the average learner and focus on the

individual learner (Bashem et al., 2016). The idea of the average student has come from the standardized tests students are required to take so that their growth can be compared to that of other students. For personalized learning to be correctly implemented, schools need to stop comparing students (Bashem et al., 2016). The goal of personalized learning is meant to be student-centered and have the students create their own learning opportunities. For middle school students, Negal and Taylor (2017) instead, suggested teachers assist students in developing their flexible pathways as the process of critical thinking that goes into the learning is more important than the final product a student may create. Meaning that middle school students need guidance toward independent learning rather than having complete freedom. If students do not have direction, the final product they create may not show the learning that occurred (Negal & Taylor, 2017). By creating flexible pathways of learning teachers can help students meet higher leveled standards than was possible in the traditional classroom setting due to the layer of formative assessments as they work through the pathway. These same pathways also allow for student voice and choice making students feel they have agency in their learning.

Although there is no peer-reviewed research to support the effectiveness of personalized learning at this time, there are many benefits to teachers and students if the right tools are available for successful implementation (Schaffhauser, 2013). Some of the tools needed for successful implementation include flexible pathways, student data profiles, flexible environments and alternative grading systems (Basham et al., 2016). The benefits of personalized learning include students meeting higher leveled standards (Negal & Taylor, 2017), increased student engagement (Bray & McClaskey, 2015; as cited by Netcoh, 2017) and student advocacy, all due to student voice and choice in learning.

Methodology

This collaborative study used an autoethnographic approach to capture the researchers' experiences of trying to manage the shift to this different style of instruction. This research used an experimental design that utilized both qualitative and quantitative data collection tools. In addition to pre and post-assessments (see Appendix A), the authors collected various forms of qualitative data including classroom observations, and teacher reflection journals (see Appendix B). Additional data was collected with regard to teacher prep time, a technology issues log, and a student mastery tracking tool (see Appendix C), to track student completion of the unit. Analysis of student written responses to both open-ended and multiple choice questions on a student engagement survey was utilized in the interest of triangulation.

The population for this action research was a group of sixth-grade mathematics students in a small town in Western Minnesota, and a group of eighth-grade students from a medium size suburb of St. Paul, Minnesota.

Table 1
Student demographics

Grade Level	Male	Female
6	11	11
8	14	7

The researchers used a strategy called the GRID Method (Ostrowski, 2015), of curriculum design which is an approach to personalized learning that emphasizes student mastery of content in a highly scaffolded format. The GRID Method is an individualized system designed

around the educational best practices such as self-paced learning, progress monitoring, goal setting, and formative assessments.

Students completed a unit using the GRID Method. The researchers each created an outline of learning activities for students consisting of five levels of progressive difficulty for each content standard specific to their content area. Each layer increased students' depth and understanding of the standard content and skills. The last layer afforded the students independent exploration and authentic application of the new material. Students moved through the "GRID" at their own pace, advancing only after achieving mastery. Mastery for this study was considered 85% correct or higher on formative assessments. A traditional summative assessment was given typically after the 3rd level. Students were given a pre and post assessment to determine a baseline and growth. Additional data collected was feedback from students, test scores, and artifacts. Students were asked to note any issues with technology during their class period. Technology issues were defined as the inability to open a web browser and any other connectivity problems that impact their ability to access necessary course material. Students marked the number on a class bulletin board at the end of the class period during the time frame they were putting away the iPads. At the end of the unit, students provided feedback using a Google Form regarding their experience using the GRID Method of personalized instruction. Questions asked of students elicited both qualitative and quantitative data regarding students' feelings about engagement, motivation, choice, and the experience as compared to a traditional classroom with respect to knowledge acquisition.

Throughout the process, from learning the GRID method to developing the unit, implementation, and finally the analysis of assessment results, researchers kept a detailed

accounting of their time spent in doing these tasks. A teacher reflection log was also used to ensure a fluid first-person rumination that captured both the positives and negatives of the process.

At the end of the study, the researchers had comprehensive data that was collected through classroom observations, a student questionnaire, pre and post-assessments, and teacher reflections. These tools provided a holistic view of the cost/reward benefit of the personalized learning model. Furthermore, to reduce the influence of bias, the researchers took great care in expressing a very neutral stance on the advantages or disadvantages of the GRID Method, or personalized learning in general.

Analysis of Data

The raw data was in the form of pre and post assessment scores from students during the GRID unit, student engagement survey, as well as observations made by the teachers in a reflective journal. The pre and post assessment scores were used to find the class average before and after the unit to examine student growth. A team of two coders systematically identified discrete categories to compensate the data from the student engagement survey. Once the categories were decided upon the responses were sorted in the Google Form document using a color code to identify the different categories. Each category was recorded by each coder to validate the correct category placement. The coders then triangulated the data by comparing the responses from each classroom. Finally, the researchers analyzed the individual teacher reflection journals. Researchers compared and contrasted the amount of time used for planning and grading prior to and during the personalized learning unit. They also used a daily scale rating of one through five to decipher overall feelings about the method.

To determine if the GRID Method was a cost-effective use of time and resources, the researchers kept a reflection journal recording how much time was spent on lesson planning and grading before and during the unit as well as recording their overall feelings about the experience using a one through five Likert scale rating.

Each of the teachers invested different amounts of time into their lesson planning and grading for the prior unit as well as the personalized learning unit (See Figures 1 and 2). Both teachers had an overall average Likert scale rating of four indicating above average ease of implementation. At the end of each day, both teachers rated their overall experience with regard to ease of classroom implementation of the GRID Method as compared to whole classroom instruction. A rating of one, for example, was representative of a teacher experiencing difficulties in two or more of the following areas; technology, procedural snafu's, or student behavior issues due to the lack of experience working with personalized instruction. On the opposite end of the Likert Scale, a rating of five is indicative of a seamless and uneventful classroom period where all students are focused and on task without technology or procedural issues, unencumbered by internal or external forces. The Likert scale ratings were then broken down weekly and by day of the week to look for similar themes. Notice Monday scored the lowest scale rating compared to the other days of the week (See Figures 3 and 4). Also, the lowest weekly averages for the teachers were different with teacher one having the lowest score on week one and teacher two having the lowest score on week three. Most weeks were over a scale rating of three showing a neutral or positive experience.

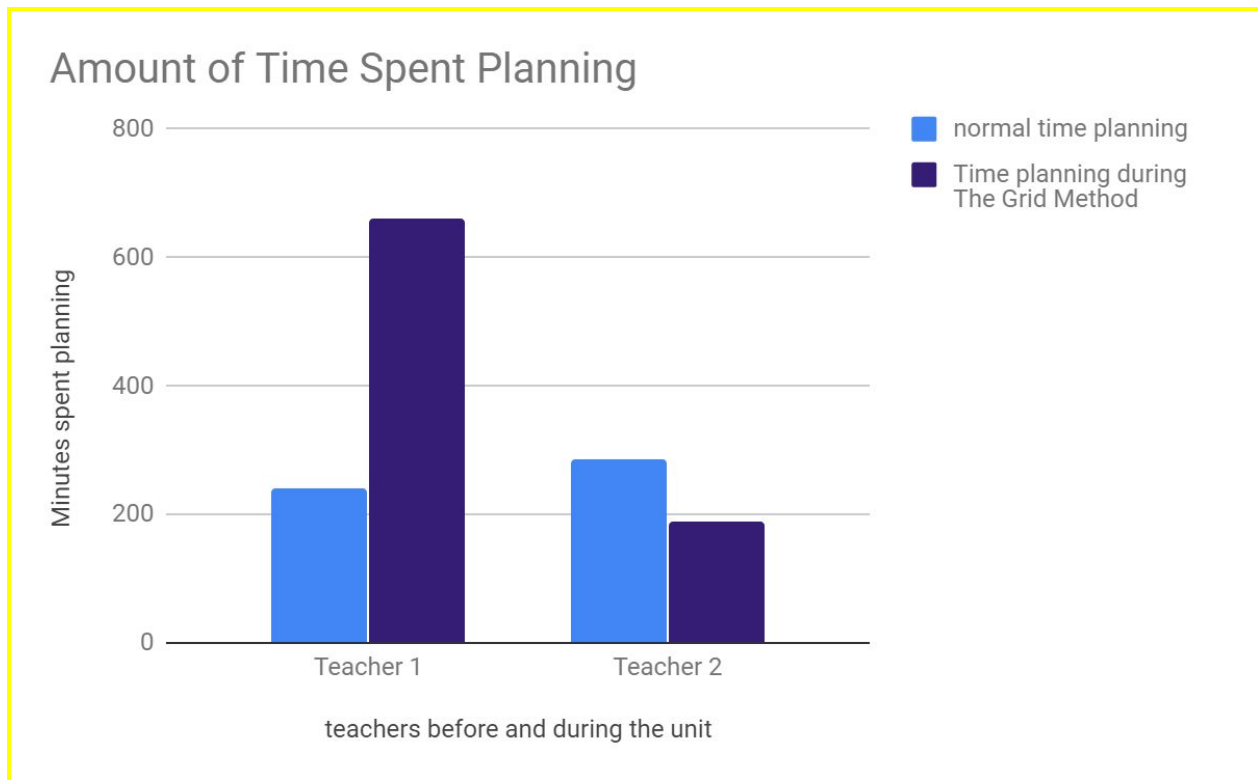


Figure 1. Amount of time spent planning.

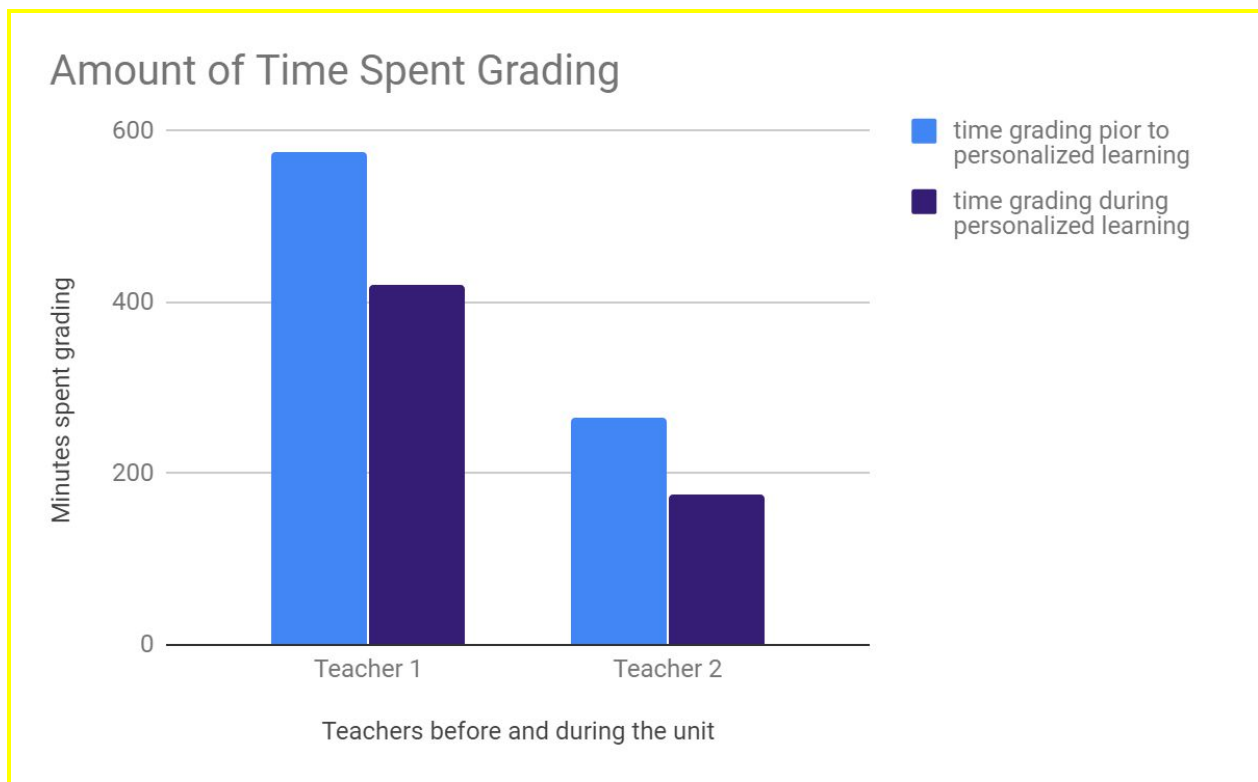


Figure 2. Amount of time spent grading.

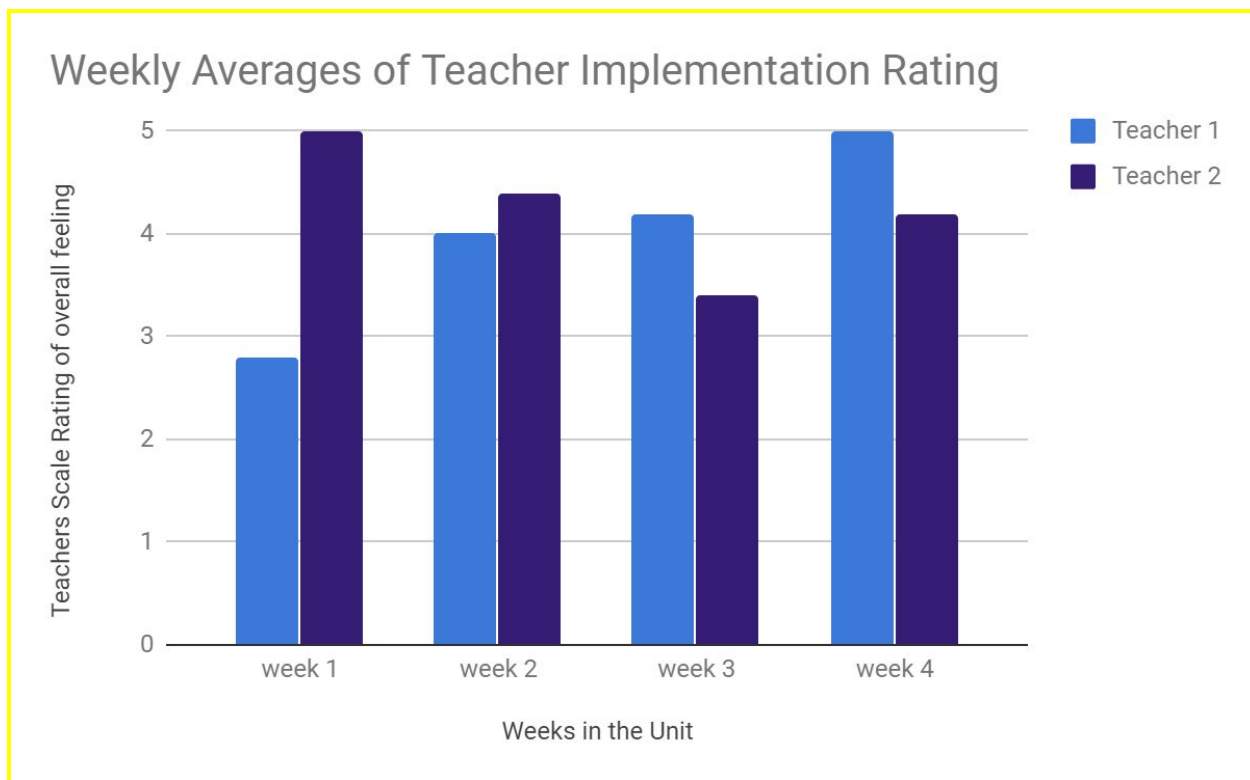


Figure 3. Weekly averages of teacher implementation rating.

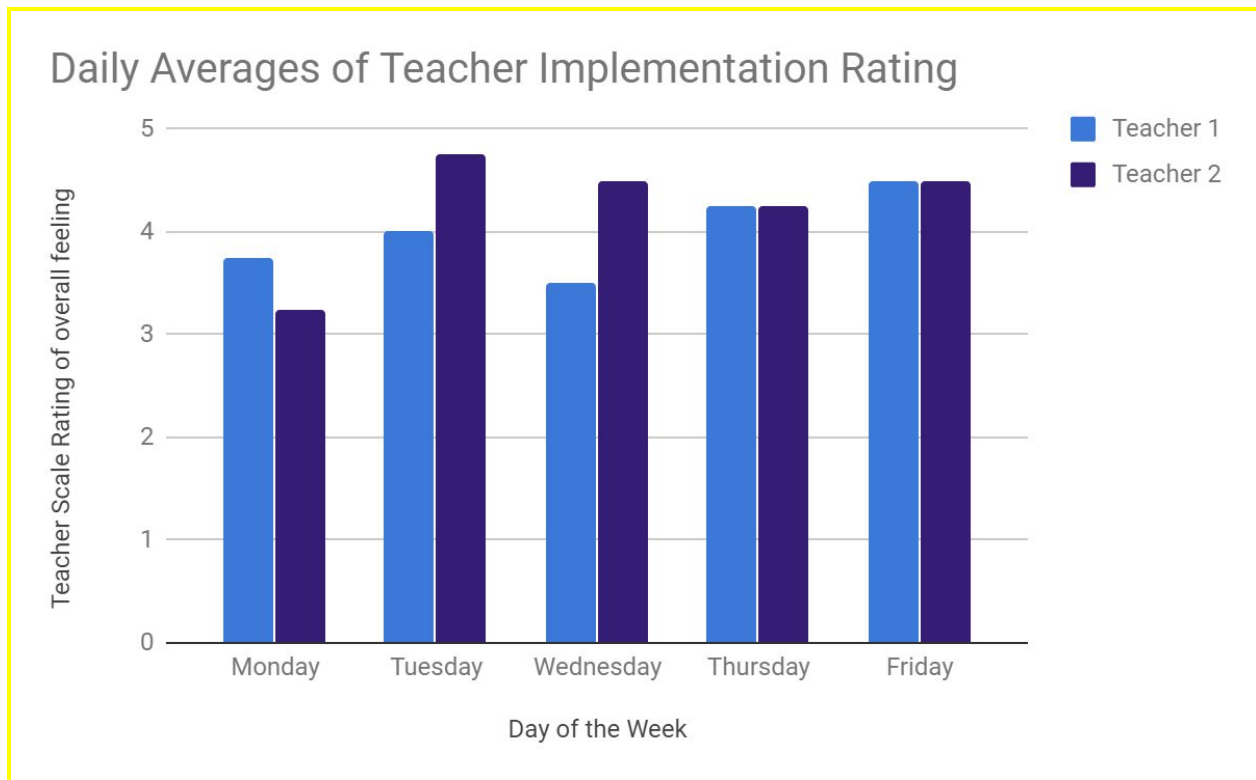


Figure 4. Daily averages of teacher implementation rating.

The next question the research study addressed was if personalized learning in the middle school classroom was an effective way for students to learn academic standards. Researchers used pre and post unit assessments to determine if students had met the required standards. After the unit was complete, the researchers analyzed the test scores by finding the class mean for both assessments. Class means for both the pre-test and post-test were then compared to look for growth.

Class averages in both classrooms were significantly higher on the posttest than averages on the pretest indicating academic growth as a class. Notice both classes average were below the minimum passing level of 60% however the class averages on the post-test for both groups were at or above the GRID Method minimum of 80%.

Table 2

Class Assessment Averages

<i>Class</i>	<i>Pretest</i>	<i>Post-test</i>
<i>6th Grade Mathematics</i>	<i>9.1 (54%)</i>	<i>61 (93%)</i>
<i>8th Grade Science</i>	<i>12.5 (57%)</i>	<i>26 (85%)</i>

Finally, the research study addressed the question if technology can aid a teacher using personalized learning to create a balanced lesson that meets the needs of both the individual student and the community of learners in the classroom. To answer this question the researchers used a student engagement survey. The researchers asked students various open-ended questions about their experience while using the personalized learning method including how they felt and if they felt it allowed them to have a voice and choice in learning. The student responses were collected using a Google Survey and were then coded into discrete categories.

Students from both classes found using The GRID Method to be an enjoyable way to learn academic standards. Students felt they could work independently without getting off task and some were even able to aide other students. 86% of the 6th-grade students felt the GRID Method made learning easier compared to only 67% of the 8th-grade students.

Table 3
Student Engagement Responses

<i>Questions</i>	<i>6th Grade Mathematics</i>	<i>8th Grade Science</i>
The GRID Method made it easier or the same as learning in a traditional classroom	19 (86%)	14 (67%)
The GRID Method made learning more fun than a traditional classroom.	21 (96%)	18 (86%)

The GRID Method allowed voice and choice in learning	<i>21 (96%)</i>	<i>19 (91%)</i>
Hardly or never off task during class time	<i>18 (82%)</i>	<i>17 (81%)</i>
Able to work independently the whole class time	<i>19 (86%)</i>	<i>17 (81%)</i>
Able to help another student during work time.	<i>17 (77%)</i>	<i>16 (76%)</i>

The purpose of this action research study is to investigate the cost-benefit of personalized learning and if it was an effective use of time and resources in the middle school classroom. The data from the resources were triangulated to show academic growth on the students' posttest, positive teacher implementation scale ratings as well as positive responses from students in the student engagement survey. With all of the data showing a positive impact on both teachers and students researchers will reflect on using the GRID Method for future units.

Action Plan

The goal of this action research project was to determine if the time spent preparing and implementing the GRID Method would yield better results in terms of teacher productivity and student academic outcomes. The research questions posed were: If the personalized learning method known as The GRID Method was a cost-effective use of time and resources in the middle school classroom? If personalized learning in the middle school classroom was an effective way for students to learn academic standards? If technology could aid a teacher using personalized learning to create a balanced lesson that meets the needs of both the individual

student and the community of learners in the classroom? Based on the analysis of the data, several conclusions can be drawn in regard to the research questions.

Based on the teacher reflective journal recording how much time was spent on lesson planning and grading before and during the unit, as well as recording their overall feelings about the experience, both teachers viewed the GRID Method as a good use of time and resources. However, there was a significant difference in the amount of time each teacher spent planning or grading due to the different skill level using technology. Teacher 1 had less experience using Google Docs and online resources such as Brain Pop, Quizlet and Quizzes. This lack of technology knowledge hindered her productive use of prep time. Teacher 1 noted that her prep time spilled into her personal time when creating the GRID for her unit. She noted this as a negative in terms of cost versus benefit. Teacher 2 had a higher level of technology experience and was much faster at creating the GRID which in turned saved her both prep time and grading time. In spite of the time spent in preparation for teaching, both teachers noted that this use of time would benefit them for future planning as the GRID can be quickly adapted to fit the ever-changing needs of each class.

Based on pre and post assessment scores that were used to measure academic growth, both classes scored significantly higher on the post-test assessment, indicating student growth. Another thing to note with regard to the post-test results, both classes scored above the GRID mastery minimum of 80%.

To determine any benefits of using technology with regard to student voice and choice, the researchers used a student engagement survey, in addition to the teacher reflection journals. Students from both classes found using The GRID Method to be an enjoyable way to learn

academic standards. The student survey results supported both teachers' classroom observations as noted in their journals. One teacher noted based on her classroom observation, there were two students who had a negative attitude about the GRID Method and personalized learning in general. These students had exhibited a negative attitude all year long and based on her relationship with the students, Teacher 1 mentioned that the students' comments did not appear to correlate to having to complete the unit using the GRID Method, because those two students appeared to enjoy using the GRID Method and did well on the unit. If those two students responses were to be eliminated from the data, 100% of the students reported that we allowed them voice and choice, versus the 91%.

The following is a compilation of both teachers conclusions of this study:

- More one on one time was spent with struggling students
- Students were more engaged due to voice and choice
- The GRID Method was an easy way to scaffold personalized learning to build on student goal setting
- Teachers were able to cover more content than the previous unit
- The setting of individual goals at the beginning of each day helped to hold students accountable for their own learning
- Fewer inappropriate behaviors were observed due to higher academic engagement and higher accountability

The following recommendations will drive our future teaching practices with respect to implementing personalized learning in the classroom:

- Teaching in a scaffolded manner on how to use The GRID Method prior to the first unit

- Having students complete daily goal setting sheet
- Posting student mastery tracking sheets to increase student accountability and self-determination
- Using in-class teacher “conference” for students to show a portfolio of work on each level before moving up to the next level on GRID

With the understanding of the upfront cost, both teachers plan to use The GRID Method for most or all of future units.

Questions and Further Research

Both teachers had the following questions after the completion of the action research:

- Is the work graded? Must teachers grade according to the attainment of standards?
- When students are unable to keep pace with the rest of the class, when is teacher intervention warranted?
- How do teachers conduct whole class activities when everyone is in different places?
- In science, how to access enough materials to do multiple labs?

While both researchers agreed that the GRID Method of personalized learning was a productive use of their time in terms of work/life balance and student outcomes, the question of the overall effectiveness of personalized learning as an instructional strategy still remains. This statement is based on the fact that the sample size was small, and it was only one unit. Further research should be done by comparing student growth using the GRID Method versus student growth using the same content of a class not using the GRID Method.

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Appendix A

Student Engagement Survey

* Required

1. Does the grid method make learning more fun for you? **Mark only one oval.*

	1	2	3	4	5	
strongly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	strongly agree

2. Does the Grid Method allow you to choose how you learn best? **Mark only one oval.*

	1	2	3	4	5	
strongly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	strongly agree

3. How often in today's class did you find yourself off-task?

4. How often today were you not understanding something and waiting for help or confused about what to do next?

5. How often today were you able to help other students in the room?

6. Do you feel you do better on the unit tests than you did before the Grid Method?*Mark only one oval.*

- ☐ Yes
- ☐ No
- ☐ about the same

Appendix B

Bauleke-Momany Teacher Reflection Journal**Planning and Grading Hours Prior to PL: Tina Becky**

Monday	Tuesday	Wednesday	Thursday	Friday
Planning: Grading:	Planning: Grading:	Planning: Grading:	Planning: Grading:	Planning: Grading:
Planning: Grading:	Planning: Grading:	Planning: Grading:	Planning: Grading:	Planning: Grading:
Planning: Grading:	Planning: Grading:	Planning: Grading:	Planning: Grading:	Planning: Grading:
Planning: Grading:	Planning: Grading:	Planning: Grading:	Planning: Grading:	Planning: Grading:

GRID Planning Time

Week	Tina	Becky

Planning and Grading Hours During PL: Tina Becky

Monday	Tuesday	Wednesday	Thursday	Friday
Planning: Grading:	Planning: Grading:	Planning: Grading:	Planning: Grading:	Planning: Grading:
Planning: Grading:	Planning: Grading:	Planning: Grading:	Planning: Grading:	Planning: Grading:
Planning: Grading:	Planning: Grading:	Planning: Grading:	Planning: Grading:	Planning: Grading:
Planning: Grading:	Planning: Grading:	Planning: Grading:	Planning: Grading:	Planning: Grading:

Date	Energizers	Frustrations	Burning Questions

Class Data Tracker

Unit: _____

[illegible]

Skills/Targets to Reteach:

Intervention Groups: